TEST Reg.No. 2

DANISH TECHNOLOGICAL INSTITUTE

Lacuna A/S
Att: Henrik Brunsø
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DK – 5550 Langeskov

Order no.	0303/653957
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Appendices	1
Initials	MFRI/MJLD

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Test report

Test specimen:	Outward opening doorhight folding window (fixed one edge and 3 casements).
Sampling:	The test specimens was forwarded by the client and received at the Danish Technological Institute November 2015. The test specimens was marked 653957 by the laboratory.
Method:	EN 1628:2011 Pedestrian doorset, windows, curtain walling, grilles and shutters – Burglar resistance –Test method for the determination of resistance under static loading. EN 1629:2011 Pedestrian doorset, windows, curtain walling, grilles and shutters – Burglar resistance – Test method for the determination of resistance under dynamic loading EN 1630:2011 Pedestrian doorset, windows, curtain walling, grilles and shutters – Burglar resistance – Test method for the determination of resistance to manual burglary attempts
Period:	The testing was carried out 27-11-2015 – 04-12-2015.
Result:	The results appear in the appendix.
Storage:	As the test is destructive and non-reproducible the samples have been removed immediately after ending the test.
Terms:	The test has been performed according to the enclosed conditions, which are according to the guidelines laid down by DANAK (The Danish Accreditation Scheme). The testing is only valid for the tested specimen. The test report may only be extracted if the laboratory has approved the extract.

22-12-2015, Danish Technological Institute, Sustainable Building

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Product description (informed by the client)

Test specimen:	Opening function	Outward opening folding door 3 casements
	Product system	Lacuna Folding Door
	Size	2130 x 2130
	Materials	Mahogany
Product group according to EN 1627		Group 1

Casement

Informed by the client	Material/type/Reference	Dimensions (mm)	Timber/Foam Density (kg/m^3)
Stiles and rails	Mahogany	72 x 78	670
Rebate	Mahogany	16 x 54	670
Corner joints			
Adhesive	Danafix 448		

Window frame

Informed by the client	Material/type	Dimensions (mm)	Density (kg/m^3)
Stiles and rails	Mahogany	54 x 116	670
Rebate	Mahogany	32 x 62	670
Corner joints	Joined		
Adhesive	Danafix 448		

Glazing

Informed by the client	Make/type/size (mm)	Location of fixing point (dimensions in mm)
Glass configuration	33,1 – 15 – 33,1 Double laminated	See Appendix 1, Figure
Gaskets	Butyl, DAFA 3x9mm	
Sealants	Ottoseal S110	

Gasket and sealing details

Informed by the client	Make/type	Size (mm)	Location
Casement edges	Primoliste	S10mm	3 x lodret
Seal continuity	DAFA Q-lon DAFA Q-lon	3054 3078	Lodret Lodret

Hardware

Informed by the client	Make/type	Size (mm)	Fixing details (dimension in mm)
Hinges	Lacuna		6 pieces, Screws: 5x35
Locking mechanism	Espagnolette M5541		Screws: 4,5x40
Handles	Lacuna	18mm	Screws: A4 5x35
Hinge protection			

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Test results

Test standard	Passed/Failed
EN 1628:2011 - Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading	**Passed**
EN 1629:2011 - Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under dynamic loading	**Passed**
EN 1630:2011 - Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts	**Passed**

Additional information - Static loading

Test standard	Conditions	Outward Opening Folding door
EN 1628:2011 - Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading	Corner of infilling 3kN Loading according to Figure 1.	**Passed** Loading in direction of removing the infill from the casement (loading from the outside towards the inside) Glazing cracks at the 3rd, 11th and 12th loading point.
	Locking points 3kN Loading according to Figure 2	**Passed** Loading in direction of opening the casement. The supporting element have been propped during the loading. While loading at point 1 the hinge gives in at the fastening. While loading at point 5, 6 and 7 the casement gives in (out of the frame) – see Figure 3. While loading point 8 the hinge gives in at the fastening.

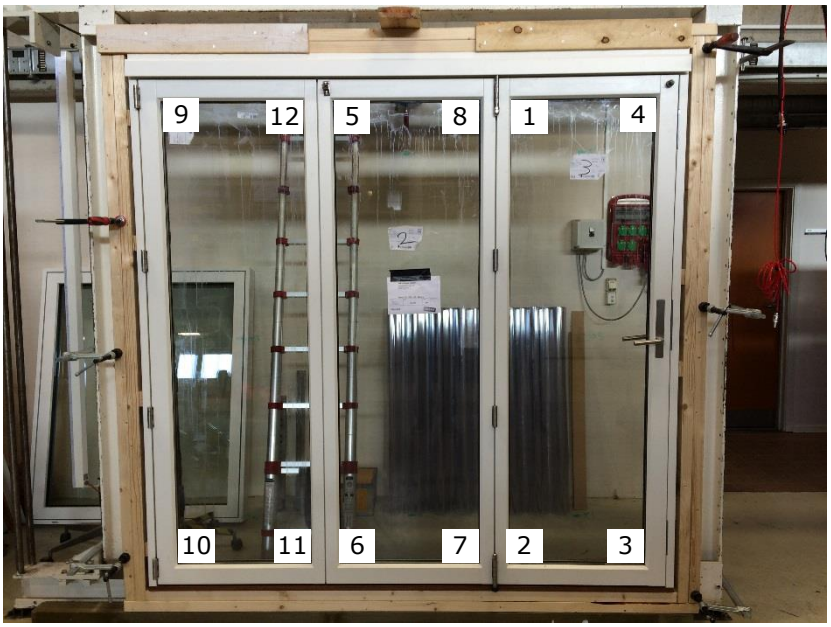

Figure 1: Static loading – Test sequence - Corner of infill

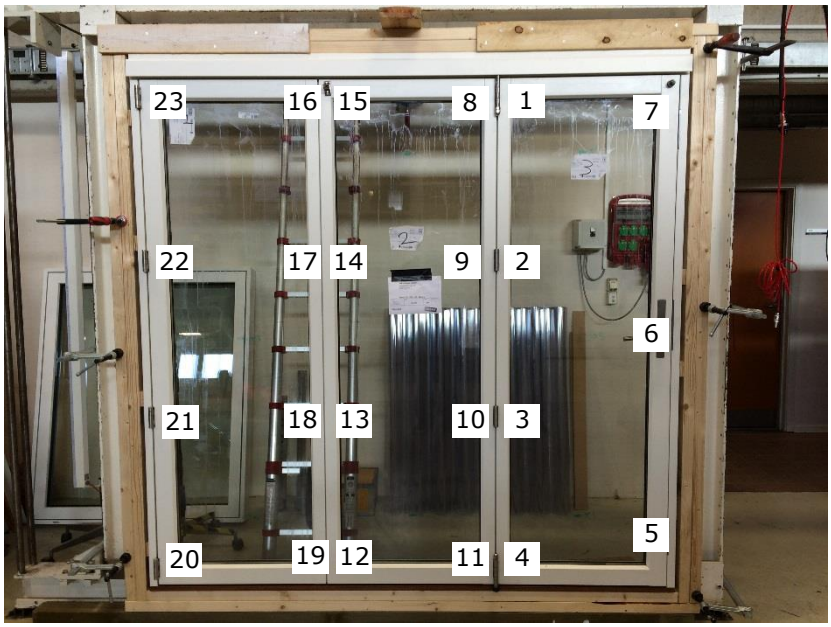

Figure 2: Static loading – Test sequence - Locking points

Figure 3: Locking point forced out during loading - not possible to pass gap gauge through opening

Additional information - Dynamic loading

Test standard	Conditions	Outward Opening Folding door
EN 1629:2011 - Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under dynamic loading	Pendulum: 50kg Drop height: 450mm Loading according to Figure 4	**Passed** The glazing bends after the dynamic loading, see Figure 5

Figure 4: Dynamic loading - Test sequence

Figure 5: Glazing after dynamic loading

Additional information - Manual attack

Test standard	Conditions	Outward Opening Folding door
EN 1630:2011 - Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts	Pretest made on element used for static and dynamic loading. Manual attack made on new element. Attack points according to to Figure 6. Toolset A1 and A2. Resistance time 3 minutes, 15 minutes used for the test in total.	**Passed** Attack point A: Hinges disengaged to force the casement to fall down Attack point B: Threshold removed with screwdriver Attack point C: Frame removed with screwdriver. Striking plate and latch attacked. Attack point D: Frame removed with screwdriver.

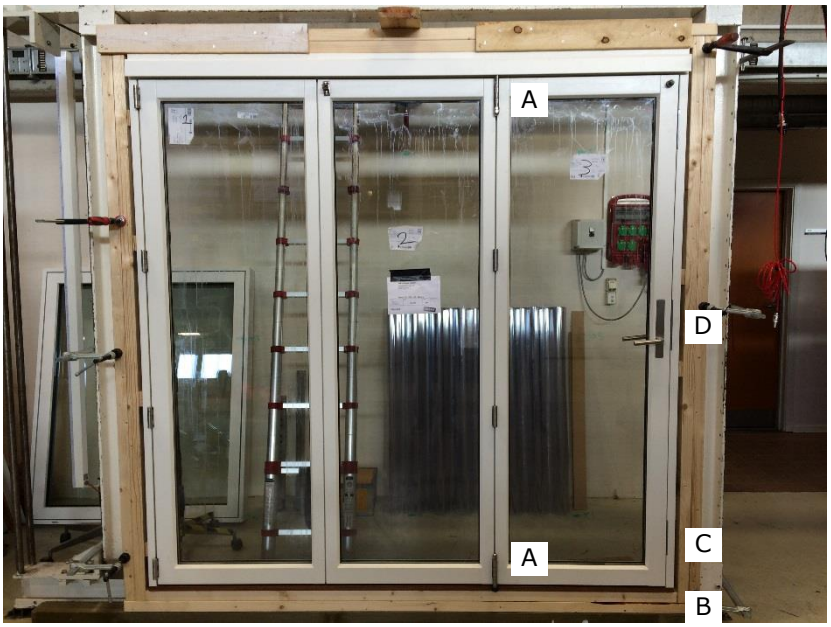

Figure 6: Areas of attack - Manual burglary resistance

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Description of product

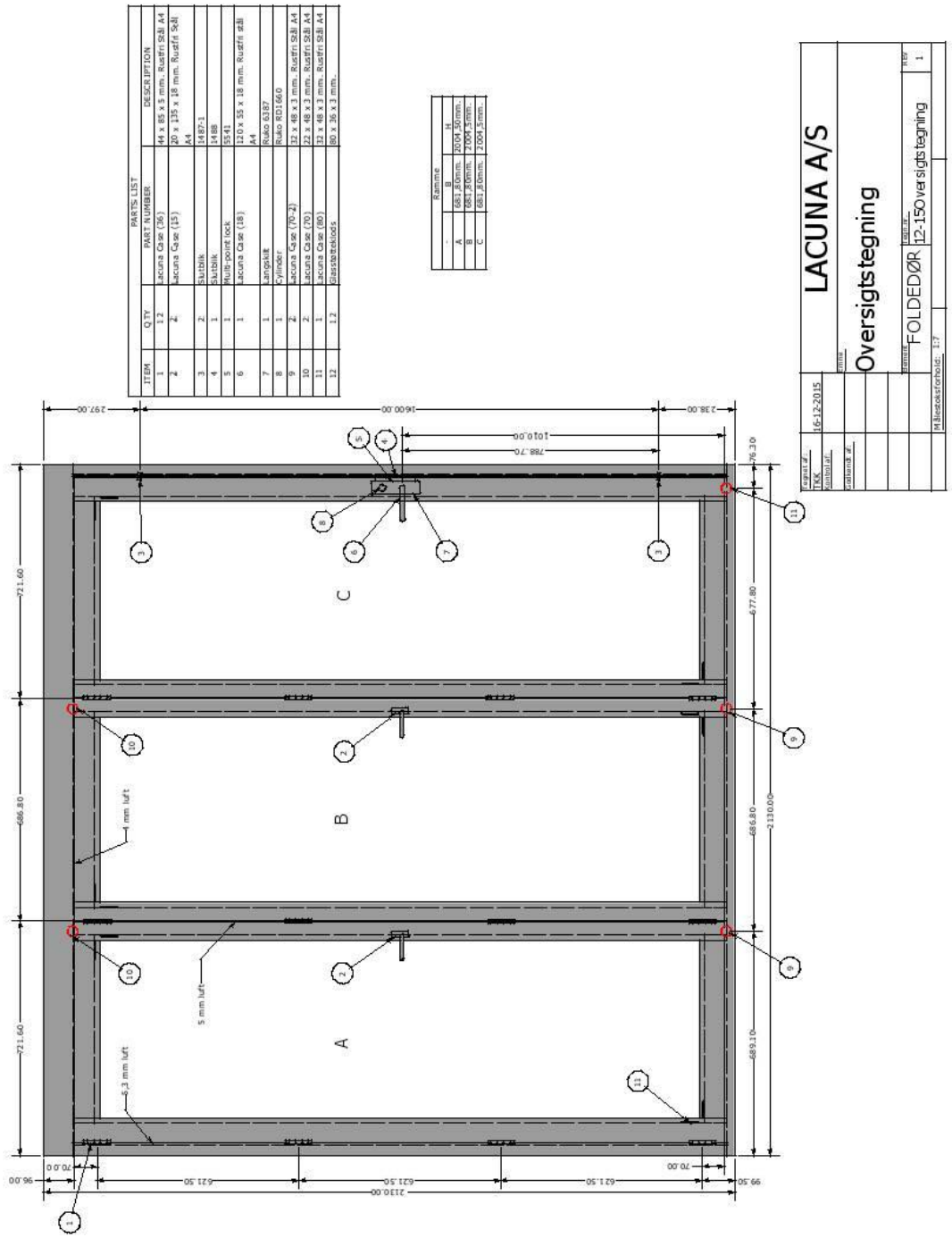

Figure 7: Overview of hardware

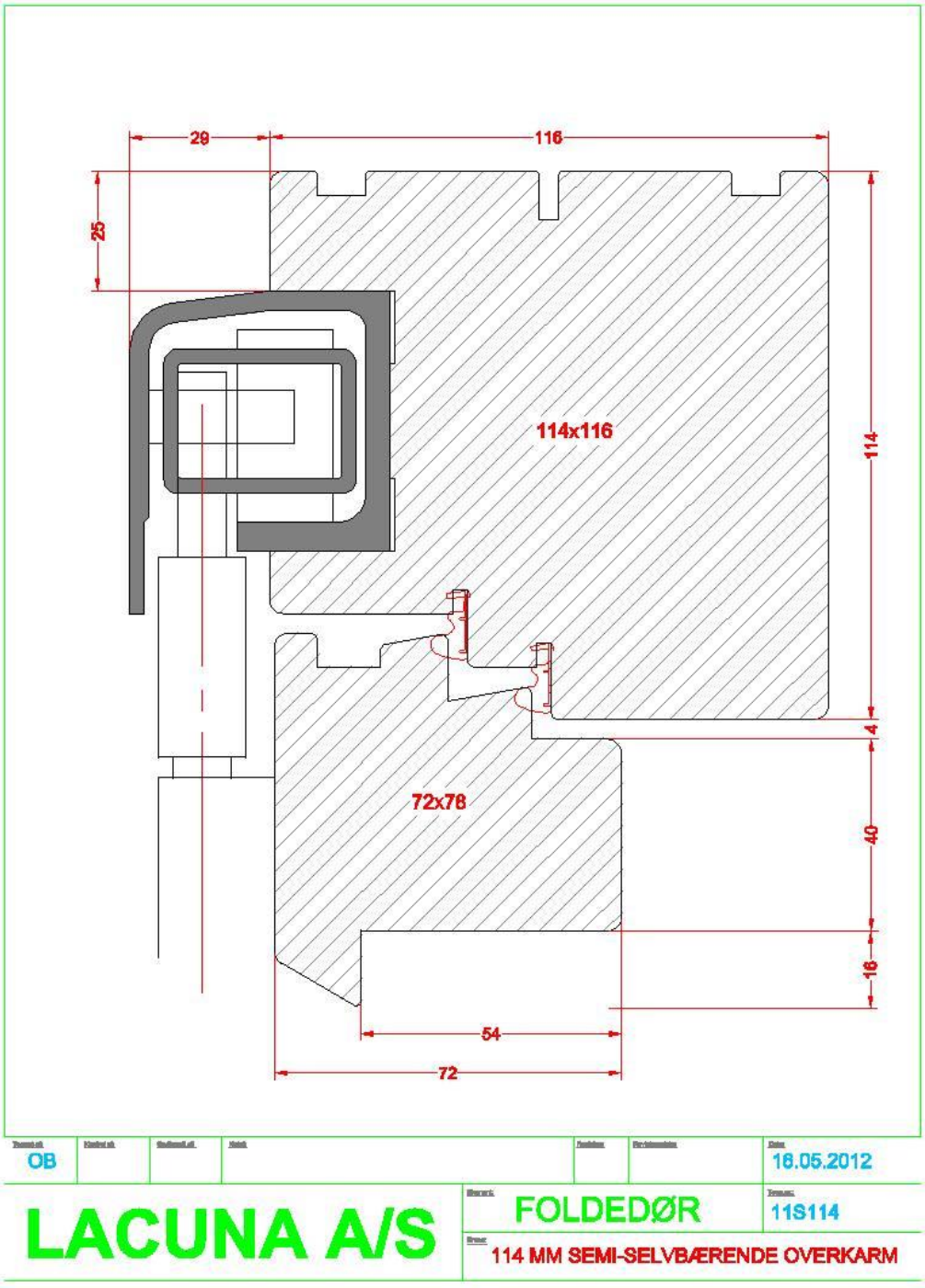

Figure 8: Folding door - head

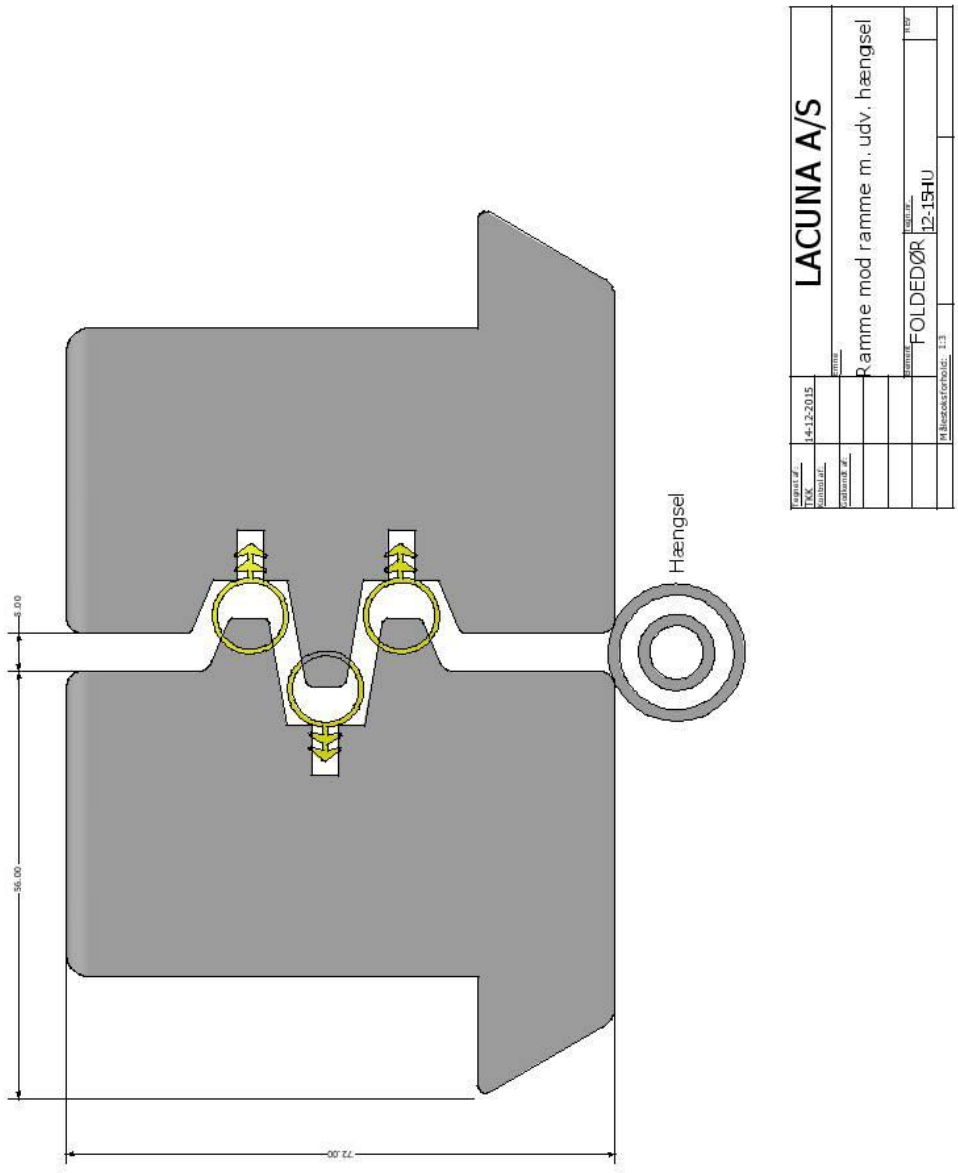

Figure 7: Joint between casements - outward hinge

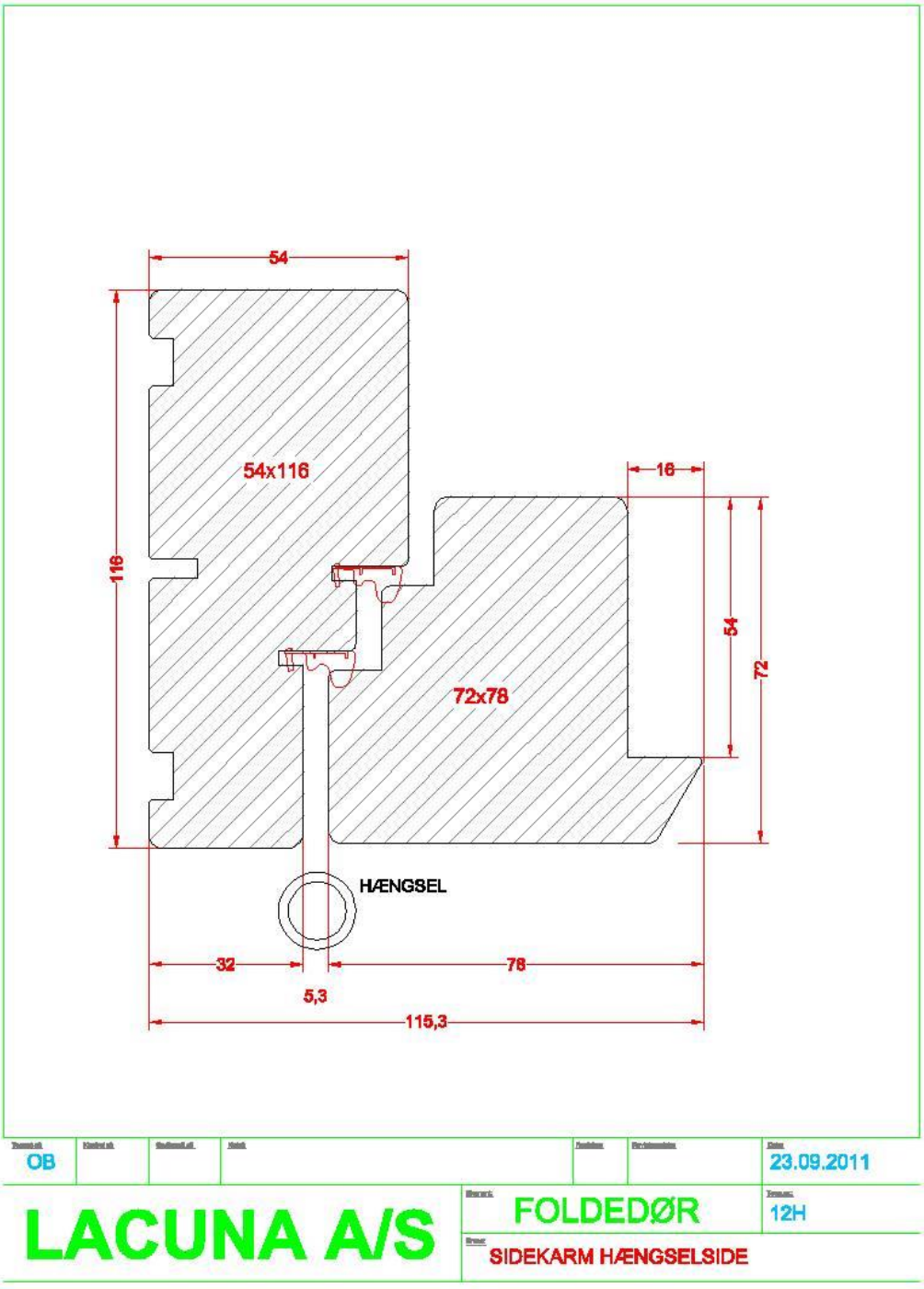

Figure 10: Jamb - hingeside

Produktbeskrivelse – EN1628 – EN 1629 – EN 1630

Test emne:	Åbne funktion	**Foldedør 3 fag**
	Størrelse	**2130 x 2130 mm**
	Materialer	**Mahogni**
Produktgruppe i henhold til EN 1627		Gruppe 1

Vinduesramme

Oplyst af kunden	Materiale/type/reference	Dimensioner (mm)	Træ/skum Massefylde (kg/m^3)
Sideramme og ramme	**Mahogni**	**72 x 78 mm**	**670kg m3**
Vinduesfals	**Mahogni**	**16 x54 mm**	**670 kg m3**
Sammenføjning			
Klæbemiddel	**Danafix 418**		

Vinduesramme/Karm

Oplyst af kunden	Materiale/type	Dimensioner (mm)	Massefylde (kg/m^3)
Sideramme og ramme	**Mahogni**	**54 x 116 mm**	**670 kg m3**
Vinduesfals	**Mahogni**	**32 x 62 mm**	**670 kg m3**
Sammenføjning			
Klæbemiddel	**Danafix 448**		

Ruder

Oplyst af kunden	Fabrikat/type/størrelse (mm)	Placering af opklodsning? (dimension i mm)
Rudeopbygning	**2 x lamineret 33,1**	
Pakning	**Butylbånd Dafa 3 x 9 mm**	
Forseglingsmiddel	**Otto Seal S 110**	

Pakning og tætningsdetaljer

Oplyst af kunden	Fabrikat/type	Størrelse (mm)	Placering
Primær pakning	**Primoliste**	**S 10 MM**	**3 X Lodret**
Tætningsgrad continuity	**Dafa Q-LON** **Dafa Q-LON**	**3054** **3078**	**2 X Lodret**

Beslag – Produkt X specifik

Oplyst af kunden	Fabrikat/type	Størrelse (mm)	Fastgørelsesdetaljer (dimension i mm)
Topstyret beslag			
Lukkeanordning	**Paskvil m 5541**		**Skruer 4,5 x 40**
Greb	**Lacuna**	**18 mm**	**Skruer A4 5 X 35**
Beskyttelse af hængsel	**Rustfri A4 dyppet i Prolan**		

Beslag – Produkt Y specifikt

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Oplyst af kunden	Make/type	Størrelse (mm)	Fastgørelsesdetaljer (dimension i mm)
Hængsler	**Lacuna**	**44 x 85 mm**	**A4 5 x 35 mm**
Lukkeanordning	**Paskvil M 5541**		
Greb	**Lacuna**	**20 x 137 mm**	**A4 5 x 35 mm**
Beskyttelse af hængsel	**Prolan**		

The general conditions pertaining to assignments accepted by Danish Technological Institute shall apply in full to the technical testing or calibration at Danish Technological Institute and to the completion of test reports or calibration certificates within the relevant field.

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The use of the accreditation mark on test reports and calibration certificates or reference to accreditation, documents that the service is provided as an accredited service under the company's DANAK accreditation according to EN ISO IEC 17025.

Construction Product Regulation:
The Danish Technological Institute guarantees that employees carrying out tests to be used together with harmonized standards under notification no. 1235 according to EU regulation 305/2011, article 43, satisfy all the requirements made for capability, integrity and impartiality. You find the CPR here:
http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/construction-products/index_en.htm

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